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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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PTOL-90A (Rev. 04/07)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *3/23/2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *12-62* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *12-62* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 March 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *11/25/2008 and 4/30/2009*.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1.   Applicant's election without traverse of **claims 12-63** in the reply filed on July 13,

2010 is acknowledged.

Specification

2.   The disclosure is objected to because of the following informalities: it recites

"Winner filter" in numerous places (paragraph 46-47, 75, and 165). However, the

examiner believes that it should be "Wiener filter" which is well known in the art.

Appropriate correction is required.

Claim Objections

Claim 57 is objected to because of the following informalities: claim 57 recites

Winner filter" in numerous places (paragraph 46-47, 75, and 165). However, the

examiner believes that it should be "Wiener filter" which is well known in the art..

Appropriate correction is required.

Claim Rejections - 35 USC § 102

3.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in
> public use or on sale in this country, more than one year prior to the date of application for patent in
> the United States.

4.   **Claims 26, 28-29, 33-34, 36, 37, and 39-40** are rejected under 35 U.S.C. 102(b)

as being anticipated by Schreiber.

Regarding **claim 26**, Schreiber discloses A method of transmitting video images,

comprising:

providing a video image (Video In, Fig.1);

compressing the video image into a coarse portion (coder 1,Fig.1);

representing a difference (subtracted from original video, Fig.1) between the coarse

portion and the video image by a refinement portion (output of coder 2, Fig.1);

mapping the coarse portion and at least part of the refinement portion into symbols of a

constellation (Fig.7 Constellation), wherein the refinement portion is mapped

uncompressed (higher levels of th coder generates analog signal, pp.974, second col,

last line); and transmitting the mapped symbols to a receiver (Transmitter at Fig.8).

Regarding **claim 28**, Schreiber discloses everything claimed above (see claim

26). Schreiber further discloses wherein mapping the portions comprises mapping the

coarse and refinement portions separately into symbols and superimposing the symbols

onto each other (Schreiber: Fig.7 Hybrid Constellation).

Regarding **claim 29**, Schreiber discloses everything claimed above (see claim

28). Schreiber further discloses wherein mapping the portions comprises mapping the

refinement portion into symbols of a constellation having a side to side distance smaller

than the distance between the symbols of a constellation of the symbols of the coarse

portion (Schreiber: Fig.7). Examiner interprets the side to side distance as angular

distance between the digital signals. Therefore the refinement portion (analog signal in

Schreiber) does not have this component (zero distance), but has a perpendicular

component.

Regarding **claim 33,** Schreiber discloses everything claimed above (see claim 26). Schreiber further discloses wherein representing the difference by a refinement portion comprises determining for each pixel a difference between the coarse portion and the provided image and wherein each value of the refinement portion represents a difference (subtracted from original video, Fig.1) between the coarse portion and the provided image at a point on the image.

Regarding **claim 34,** Schreiber discloses everything claimed above (see claim 33). Schreiber further discloses wherein each value of the refinement portion represents a difference between the coarse portion and the provided image at a point on the image coinciding with a pixel (subtracted from original video, Fig.1, it was anticipated that subtraction is done by pixel by pixel).

Regarding **claim 36,** Schreiber discloses everything claimed above (see claim 26). Schreiber further discloses wherein mapping the portions comprises mapping the refinement portion into symbols of a constellation having a bin (angular distance between neighboring constellations in Fig.7) for each of the possible values of the difference between the coarse portion and the provided image for a specific point on the image.

Regarding **claim 37,** Schreiber discloses everything claimed above (see claim 26). Schreiber further discloses wherein the refinement portion is mapped uncoded (Analog, Schreiber: Level 2 Analog, Fig.8) into symbols. Examiner maintains that the refinement portion can be transmitted either by Level 2 digital only or by Level 2 Analog only in Schreiber (Fig.8) without level 3.

Regarding **claim 39,** Schreiber discloses everything claimed above (see claim 26). Schreiber further discloses wherein the coarse portion is protected by a forward error correction code Schreiber: FEC, Fig.8), while the refinement portion (Schreiber: Level 2 Analog, Fig.8) is transmitted without protection by a forward error correction code.

Regarding **claim 40,** Schreiber discloses everything claimed above (see claim 26). Schreiber further discloses wherein mapping the portions comprises mapping the refinement portion into a constellation having a discrete number of possible values (digital, Level 2 Digital, Fig.8). Examiner maintains that the refinement portion can be transmitted either by Level 2 digital only or by Level 2 Analog only in Schreiber (Fig.8) without level 3.

5.   **Claims 55- 56** are rejected under 35 U.S.C. 102(b) as being anticipated by Agee (US 2004/0.095,907), hereafter referenced as Agee.

Regarding **claim 55**, Agee discloses Method and Apparatus for Optimization of Wireless Multipoint Electromagnetic Communication Networks. Agee specifically discloses A method of transmitting data, comprising:

generating a plurality of streams (plurality of digital data stream is multiplexed over communication channel, paragraph 49) at least partially carrying data which gracefully degrades (graceful degradation, claim 149) with noise;

transmitting the plurality of streams in parallel (transmit data through each subchannel, paragraph 71) through a MIMO transmitter (MIMO system, paragraph 69); and

receiving the plurality of streams (receiving RF signal from each antenna, Digital stream

from each antenna, paragraph 109) by a MIMO receiver.

Regarding **claim 56,** Agee discloses everything claimed above (see claim 55).

Agee further discloses comprising decoding the plurality of symbol streams by the

MIIMO receiver (symbol decoding bank to recover the message, paragraph 389).

Claim Rejections - 35 USC § 103

6.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

7.   **Claims 12-22, 24-25, 27, 31-32, 35, and 38** are rejected under 35 U.S.C. 103(a)

as being unpatentable over Schreiber (Proceedings of the IEEE, vol.83, No.6) in view

of Seroussi (US 5,764,374), hereafter referenced as Schreiber and Seroussi

respectively.

Regarding **claim 12**, Schreiber discloses Advanced Television Systems for

Terrestrial Broadcasting: Some Problems and Some Proposed Solutions. Specifically

Schreiber discloses A method of transmitting video images (Fig.1), comprising:

providing a video image (Video In, Fig.1);

compressing the video image into a coarse portion (coder 1,Fig.1), which has, for at

least one color component (Well known in the art that video is compressed in 3 color

components, RGB or YUV);

representing the difference (subtracted from original video, Fig.1) between the coarse

portion and the video image by a refinement portion (output of coder 2, Fig.1);

mapping the coarse portion and at least part of the refinement portion into symbols of a

constellation (Fig.7 Constellation); and

transmitting the mapped symbols to a receiver (Transmitter at Fig.8).

However Schreiber fails to disclose a bounded difference from the provided image, for a

predetermined set of the pixels of the image.

In the analogous field of endeavor, Seroussi discloses System and Method for

Lossless Image Compression Having Improved Sequential Determination of Golomb

Parameter. Seroussi specifically discloses near –lossless compression based on a

bounded difference from the provided image (Uniform bound E (e.g. 1, 2, 5, 7) on the

difference between each original pixel and its decoded pixel, col.25, line 40-43), for a

predetermined set (all the pixels) of the pixels of the image, in order to provide low

complexity compression (col.6, line 54-56).

Therefore, given this teaching, it would have been obvious to one of ordinary skill

in the art at the time invention was made to modify Schreiber by substituting the source

coding based on MPEG (Fig.6) for the level 1 (coarse portion) with near-lossless

encoder, in order to provide low complexity compression. The Schreiber Multiresolution

source and channel coding, substituting source encoder with the Seroussi near –

lossless compression based on a bounded difference from the provided image, has all

the features of claim 12.

Regarding **claim 13**, the Schreiber Multiresolution source and channel coding, substituting source encoder with the Seroussi near –lossless compression based on a bounded difference from the provided image, as applied to claim 12, discloses wherein compressing the video image comprises compressing such that the difference between the coarse portion and the provided image is bounded for substantially all the pixels of the image (all the pixels in image).

Regarding **claim 14**, the Schreiber Multiresolution source and channel coding, substituting source encoder with the Seroussi near –lossless compression based on a bounded difference from the provided image, as applied to claim 12, discloses wherein compressing the video image comprises compressing such that the difference between the coarse portion and the provided image is bounded to have at most ten different possible values (Seroussi: Uniform error bound 4 (col.25, line 40-43), means 0, +/-1, +/-2, +/-3, +/-4, which has 9 different possible values).

Regarding **claim 15**, the Schreiber Multiresolution source and channel coding, substituting source encoder with the Seroussi near –lossless compression based on a bounded difference from the provided image, as applied to claim 12, discloses wherein compressing the video image comprises compressing such that the difference between the coarse portion and the provided image is bounded to have at most five different possible values (Seroussi: Uniform error bound 2 (col.25, line 40-43), means 0, +/-1, +/-2, which has 5 different possible values).

Regarding **claim 16**, the Schreiber Multiresolution source and channel coding, substituting source encoder with the Seroussi near –lossless compression based on a

bounded difference from the provided image, as applied to claim 12, discloses wherein the difference between the coarse portion and the provided image is bounded by a maximal value which is less than 5% of the possible values of the provided images, because the pixel is usually represented by 8 bits and therefore there are 256 possible values and 5% of 256 is about 13. Seroussi already discloses uniform bound 1, 2, 5, and 7 which are less than 5% of possible values.

Regarding **claim 17**, the Schreiber Multiresolution source and channel coding, substituting source encoder with the Seroussi near –lossless compression based on a bounded difference from the provided image, as applied to claim 12, discloses wherein compressing the video image comprises compressing such that the difference between the coarse portion and the provided image is bounded for substantially all the color components representing the image (Seroussi: color space (RGB or YUV), col.1, line 56).

Regarding **claim 18**, the Schreiber Multiresolution source and channel coding, substituting source encoder with the Seroussi near –lossless compression based on a bounded difference from the provided image, as applied to claim 12, discloses wherein mapping the portions comprises mapping the coarse and refinement portions separately into symbols and superimposing the symbols onto each other (Schreiber: Fig.7 Hybrid Constellation).

Regarding **claim 19**, the Schreiber Multiresolution source and channel coding, substituting source encoder with the Seroussi near –lossless compression based on a bounded difference from the provided image, as applied to claim 18, discloses wherein

mapping the portions comprises mapping the refinement portion into symbols of a

constellation having a side to side distance smaller than the distance between the

symbols of a constellation of the symbols of the coarse portion (Schreiber: Fig.7).

Examiner interprets the side to side distance as angular distance between the digital

signals. Therefore the refinement portion (analog signal in Schreiber) does not have this

component (zero distance), but has a perpendicular component.

Regarding **claim 20**, the Schreiber Multiresolution source and channel coding,

substituting source encoder with the Seroussi near –lossless compression based on a

bounded difference from the provided image, as applied to claim 12, discloses wherein

the coarse portion is protected by a forward error correction code Schreiber: FEC,

Fig.8), while the refinement portion (Schreiber: Level 2 Analog, Fig.8) is transmitted

without protection by a forward error correction code.

Regarding **claim 21**, the Schreiber Multiresolution source and channel coding,

substituting source encoder with the Seroussi near –lossless compression based on a

bounded difference from the provided image, as applied to claim 12, discloses wherein

the refinement portion is mapped uncoded (Analog, Schreiber: Level 2 Analog, Fig.8)

into symbols. Examiner maintains that the refinement portion can be transmitted either

by Level 2 digital only or by Level 2 Analog only in Schreiber (Fig.8) without level 3.

Regarding **claim 22**, the Schreiber Multiresolution source and channel coding,

substituting source encoder with the Seroussi near –lossless compression based on a

bounded difference from the provided image, as applied to claim 12, discloses wherein

mapping the portions comprises mapping the refinement portion into a constellation

having a discrete number of possible values (Schreiber: digital, Level 2 Digital, Fig.8).

Examiner maintains that the refinement portion can be transmitted either by Level 2

digital only or by Level 2 Analog only in Schreiber (Fig.8) without level 3.

Regarding **claim 24**, the Schreiber Multiresolution source and channel coding,

substituting source encoder with the Seroussi near –lossless compression based on a

bounded difference from the provided image, as applied to claim 12, discloses wherein

representing the difference between the coarse portion and the video image by a

refinement portion formed of a plurality of refinement sub-portions, each of which has a

smaller side to side constellation size (Schreiber: Fig.7). Examiner interprets the side to

side distance as angular (circumferential) distance between the digital signals.

Therefore the refinement portion (analog signal in Schreiber) does not have this

component (zero distance), but has a perpendicular (radial) component.

Regarding **claim 25**, the Schreiber Multiresolution source and channel coding,

substituting source encoder with the Seroussi near –lossless compression based on a

bounded difference from the provided image, as applied to claim 12, discloses wherein

the coarse and refinement portions (Layered coding with Near-lossless encoding with

coarse portion) together represent the video image in a non-compressed standard (Not

a compression standard such as MPEG) representation of color video with at most

slight filtering (No filtering).

Regarding **claim 27**, the Schreiber Multiresolution source and channel coding,

substituting source encoder with the Seroussi near –lossless compression based on a

bounded difference from the provided image, as applied to claim 12, discloses wherein

compressing the video image comprises compressing such that the difference between the coarse portion and the provided image is bounded (Seroussi: Uniform bound E (e.g. 1, 2, 5, 7) on the difference between each original pixel and its decoded pixel, col.25, line 40-43) for substantially all the pixels of the image (all the pixels in image).

Regarding **claim 31**, Schreiber discloses everything claimed above (see claim 26). However, Schreiber fails to disclose wherein representing the difference by a refinement portion comprises determining for each pixel a difference between the coarse portion and the provided image and wherein each value of the refinement portion is related to at most 100 pixels of the image.

Seroussi specifically discloses a near lossless compression using prediction based on already encoded 6 neighboring pixels (Fig.3), in order to provide low complexity compression (col.6, line 54-56).

Therefore, given this teaching, it would have been obvious to one of ordinary skill in the art at the time invention was made to modify Schreiber by substituting the source coding based on MPEG (Schreiber: Fig.6) for the level 1 (coarse portion) with near lossless compression using prediction based on already encoded 6 neighboring pixels, as taught by Van, in order to provide low complexity compression. The Schreiber Multiresolution source and channel coding, substituting source encoder with the Seroussi near lossless compression using prediction based on already encoded 6 neighboring pixels, has all the features of claim 31.

Regarding **claim 32**, Schreiber discloses everything claimed above (see claim 26). However, Schreiber fails to disclose wherein representing the difference by a

refinement portion comprises determining for each pixel a difference between the coarse portion and the provided image and wherein each value of the refinement portion is related to at most 10 pixels of the image.

Seroussi specifically discloses a near lossless compression using prediction based on already encoded 6 neighboring pixels (Fig.3), in order to provide low complexity compression.

Therefore, given this teaching, it would have been obvious to one of ordinary skill in the art at the time invention was made to modify Schreiber by substituting the source coding based on MPEG (Fig.6) for the level 1 (coarse portion) with near lossless compression using prediction based on already encoded 6 neighboring pixels, as taught by Van, in order to provide low complexity compression. The Schreiber Multiresolution source and channel coding, substituting source encoder with the Seroussi near lossless compression using prediction based on already encoded 6 neighboring pixels, has all the features of claim 12.

Regarding **claim 35**, the Schreiber Multiresolution source and channel coding, substituting source encoder with the Seroussi near lossless compression using prediction based on already encoded 6 neighboring pixels, as applied to claim 31 and 33, discloses wherein at least one value of the refinement portion represents a difference between the coarse portion and the provided image at a point on the image interpolated for two or more neighboring pixels (Seroussi: Fig.3 shows prediction based on interpolation of 6 neighboring pixels).

Regarding **claim 38**, the Schreiber Multiresolution source and channel coding,

substituting source encoder with the Seroussi near lossless compression using

prediction based on already encoded 6 neighboring pixels, as applied to claim 31 and

33, discloses wherein the refinement portion is mapped without undergoing a transform

into a non-image domain (there is no transformation to other domain in near lossless

compression).

8.   **Claims 23** are rejected under 35 U.S.C. 103(a) as being unpatentable over

Schreiber in view of Seroussi, further in view of Shattil (US 2004/0,141,548), hereafter

referenced as Shattil.

Regarding **claim 23**, Schreiber and Seroussi disclose everything claimed above

(see claim 12). However, they fail to disclose wherein transmitting the mapped symbols

comprise transmitting over a multi-input multi-output MIMO link.

In the analogous field of endeavor, Shattil discloses Software Adaptable High

Performance Multicarrier Transmission. Shattil specifically discloses wherein

transmitting the mapped symbols comprise transmitting over a multi-input multi-output

MIMO link (MIMO, paragraph 233), for the purpose of PAPR-reduction (paragraph 133).

Therefore, given this teaching, it would have been obvious to one of ordinary skill

in the art at the time invention was made to modify Schreiber and Seroussi by

specifically providing transmitting the mapped symbols over a multi-input multi-output

MIMO link, for the purpose of PAPR-reduction. The Schreiber Multiresolution source

and channel coding, substituting source encoder with the Seroussi near –lossless

compression based on a bounded difference from the provided image, further

incorporating the Shattil transmitting the mapped symbols over a multi-input multi-output

MIMO link, has all the features of claim 23.

9.   **Claim 30** is rejected under 35 U.S.C. 103(a) as being unpatentable over

Schreiber in view of Shattil.

Regarding **claim 30**, Schreiber discloses everything claimed above (see claim

26). However, Schreiber fails to disclose wherein transmitting the mapped symbols

comprise transmitting over a multi-input multi-output MIMO link.

Shattil specifically discloses wherein transmitting the mapped symbols comprise

transmitting over a multi-input multi-output MIMO link (MIMO, paragraph 233), for the

purpose of PAPR-reduction (paragraph 133).

Therefore, given this teaching, it would have been obvious to one of ordinary skill

in the art at the time invention was made to modify Schreiber by specifically providing

transmitting the mapped symbols over a multi-input multi-output MIMO link, for the

purpose of PAPR-reduction The Schreiber Multiresolution source and channel coding,

incorporating the Shattil transmitting the mapped symbols over a multi-input multi-output

MIMO link, has all the features of claim 30.

10.   **Claim 41** is rejected under 35 U.S.C. 103(a) as being unpatentable over

Schreiber.

Regarding **claim 41**, Schreiber discloses everything claimed above (see claim 26). In addition, Schreiber teaches wherein mapping the portions comprises mapping the refinement portion into a constellation such that its value degrades gracefully with noise (analog transmission of refinement portion (level 2 analog) in Fig.8, because it was well known that analog transmission degrades gracefully with noise compared to digital transmission which has a cliff effect).

11.   **Claims 42-44, 46, and 49** are rejected under 35 U.S.C. 103(a) as being unpatentable over Schreiber in view of Taubman (US 6,778,709), hereafter referenced as Taubman.

Regarding **claim 42**, Schreiber discloses A method of transmitting video images, comprising:

providing a video image (Video In, Fig.1) ;

compressing the video image into a coarse portion (coder 1,Fig.1), having a first average number of bits per pixel (bits per pixel is calculated from bit rates of video compression and frames/sec and pixels in frame);

representing the difference (subtracted from original video, Fig.1) between the coarse portion and the video image by a refinement portion (output of coder 2, Fig.1);

mapping the coarse and refinement portions into symbols of a constellation (Fig.7 Constellation); and

transmitting the mapped symbols to a receiver (Transmitter at Fig.8).

However Schreiber fails to disclose having an average equivalent bit rate of the refinement portion requiring a greater number of bits per pixel, for representation, than the first average number.

In the analogous field of endeavor, Taubman discloses Embedded Block Coding With Optimized Truncation. Taubman specifically discloses having an average equivalent bit rate of the refinement portion requiring a greater number of bits per pixel, for representation, than the first average number (0.25 bits per pixel for the first layer, 0.5 bits per pixel for the second layer, col.14, line 14-18), in order to provide efficient bit rate control (col.2, line 12-13).

Therefore, given this teaching, it would have been obvious to one of ordinary skill in the art at the time invention was made to modify Schreiber by specifically providing higher average bit rate for the enhanced layer compared to the bitrate of coarse layer, as taught by Taubman, in order to provide efficient bit rate control. The Schreiber Multiresolution source and channel coding, incorporating the Taubman higher average bit rate for the enhanced layer compared to the bitrate of coarse layer, has all the features of claim 42.

Regarding **claim 43**, Schreiber and Taubman disclose everything claimed above (see claim 42). Schreiber further discloses wherein the refinement portion is not represented by bits (Level 2 Analog, Fig.8).

Regarding **claim 44**, Schreiber and Taubman disclose everything claimed above (see claim 42). Schreiber further discloses wherein the refinement portion has a

predetermined number of values for each symbol. (Level 2 Digital Fig.8, without analog portion).

Regarding **claim 46**, Schreiber and Taubman disclose everything claimed above (see claim 42). Schreiber further discloses wherein mapping the portions comprises mapping the coarse and refinement portions separately into symbols and superimposing the symbols onto each other (Fig.7).

Regarding **claim 49**, the Schreiber Multiresolution source and channel coding, incorporating the Taubman higher average bit rate for the enhanced layer compared to the bitrate of coarse layer, as applied to claim 42, discloses wherein the average equivalent bit rate of the refinement portion requires for representation at least twice the number of bits from the first average number (Taubman: 0.25 bits per pixel for the first layer, 0.5 bits per pixel for the second layer, col.14, line 14-18).

12.   **Claims 45 and 47-48** are rejected under 35 U.S.C. 103(a) as being unpatentable over Schreiber in view of Taubman, further in view of Seroussi.

Regarding **claim 45**, Schreiber and Taubman disclose everything claimed above (see claim 42). Schreiber and Taubman fail to disclose wherein compressing the video image comprises compressing such that the difference between the coarse portion and the provided image is bounded to have at most ten different possible values.

Seroussi specifically discloses near-lossless encoder compressing the video image comprises compressing such that the difference between the coarse portion and the provided image is bounded to have at most ten different possible values. (Uniform

bound E (e.g. 1, 2, 5, 7) on the difference between each original pixel and its decoded

pixel, col.25, line 40-43), in order to provide low complexity compression (col.6, line 54-

56).

Therefore, given this teaching, it would have been obvious to one of ordinary skill

in the art at the time invention was made to modify Schreiber by substituting source

encoder with the Seroussi near-lossless encoder, as taught by Seroussi, in order to

provide low complexity compression. The Schreiber Multiresolution source and channel

coding, incorporating the Taubman higher average bit rate for the enhanced layer

compared to the bitrate of coarse layer, further substituting source encoder with the

Seroussi near-lossless encoder, has all the features of claim 45.

Regarding **claim 47**, the Schreiber Multiresolution source and channel coding,

incorporating the Taubman higher average bit rate for the enhanced layer compared to

the bitrate of coarse layer, further substituting source encoder with the Seroussi near-

lossless encoder, as applied to claim 45, discloses wherein representing the difference

by a refinement portion comprises determining for each pixel a difference between the

coarse portion and the provided image and wherein each value of the refinement

portion is related to at most 10 pixels of the image (Seroussi: Fig.3 shows the prediction

based on 6 neighboring pixels).

Regarding **claim 48**, the Schreiber Multiresolution source and channel coding,

incorporating the Taubman higher average bit rate for the enhanced layer compared to

the bitrate of coarse layer, further substituting source encoder with the Seroussi near-

lossless encoder, as applied to claim 45, discloses wherein the coarse portion is

protected by a forward error correction code (Schreiber: FEC, Fig.8), while the

refinement portion (Schreiber: Level 2 Analog, Fig.8) is transmitted without protection by

a forward error correction code.

13.   **Claims 50-54** are rejected under 35 U.S.C. 103(a) as being unpatentable over

Schreiber in view of Van (US 2003/0,179,938).

Regarding **claim 50**, Schreiber discloses A method of transmitting video images,

comprising:

providing a video image (Video In, Fig.1);

compressing the video image into a coarse portion (coder 1,Fig.1), using a near

lossless compression;

method achieving less than a 15:1 compression ratio;

representing the difference (subtracted from original video, Fig.1) between the coarse

portion and the video image by a refinement portion (output of coder 2, Fig.1);

mapping the coarse and refinement portions into symbols of a constellation (Fig.7

Constellation); and

transmitting the mapped symbols to a receiver (Transmitter at Fig.8).

However, Schreiber fails to disclose using a near lossless compression for coarse

portion and method achieving less than a 15:1 compression ratio.

In the analogous field of endeavor, Van discloses Device and Method for

Compressing a Signal. Van specifically discloses near lossless compression based on a

desirable compression ratio (paragraph 6 and 7), in order to combat a limited bandwidth

(paragraph 6). The compression ratio is dictated by a limited bandwidth, which could be less than 15:1.

Therefore, given this teaching, it would have been obvious to one of ordinary skill in the art at the time invention was made to modify Schreiber by substituting the source coding based on MPEG (Fig.6) for the level 1 (coarse portion) with near lossless compression based on desirable compression ratio of less than 15:1, as taught by Van, in order to combat a limited bandwidth. The Schreiber Multiresolution source and channel coding, substituting source encoder with the Van near lossless compression based on desirable compression ratio of less than 15:1, has all the features of claim 50.

Regarding **claim 51**, Schreiber and Van disclose everything claimed above (see claim 50). Schreiber further discloses wherein mapping the portions comprises mapping the coarse and refinement portions separately into symbols and superimposing the symbols onto each other (Fig.7).

Regarding **claim 52**, Schreiber and Van disclose everything claimed above (see claim 51). Schreiber further discloses wherein the coarse portion is protected by a forward error correction code (Schreiber: FEC, Fig.8), while the refinement portion (Schreiber: Level 2 Analog, Fig.8) is transmitted without protection by a forward error correction code.

Regarding **claim 53**, Schreiber and Van disclose everything claimed above (see claim 50). Van teaches wherein compressing the video image comprises compressing with a compression ratio of less than 8:1 (Van: a desirable compression ratio, paragraph 6, could be 8:1 because of limited bandwidth).

Regarding **claim 54**, Schreiber and Van disclose everything claimed above (see claim 50). Van teaches wherein compressing the video image comprises compressing with a compression ratio of less than 12:1 (Van: a desirable compression ratio, paragraph 6, could be 12:1 because of limited bandwidth).

14.   **Claims 57** is rejected under 35 U.S.C. 103(a) as being unpatentable over Agee in view of Shattil.

Regarding **claim 57**, Agee discloses everything claimed above (see claim 56). However, Agee fails to disclose wherein the MIMO receiver uses a spatial Winner filter to decode the streams.

Shattil discloses wherein the MIMO receiver uses a spatial Winner filter to decode the streams (Wiener filter, paragraph 111), in order to equalize the symbol during decoding (paragraph 111).

Therefore, given this teaching, it would have been obvious to one of ordinary skill in the art at the time invention was made to modify Agee by specifically providing a spatial Wiener filter, in order to equalize the symbol during decoding. The Agee MIMO transmission, incorporating the Shattil spatial wiener filter during decoding, has all the features of claim 57.

15.   **Claims 58-61** are rejected under 35 U.S.C. 103(a) as being unpatentable over Agee in view of Schreiber.

Regarding **claim 58**, Agee discloses everything claimed above (see claim 56).

However, Agee fails to disclose wherein the streams include analog streams.

Schreiber discloses wherein the streams include analog streams (Level 2

Analog, Fig.8), in order to transmit enhanced portion for the layered coding.

Therefore, given this teaching, it would have been obvious to one of ordinary skill

in the art at the time invention was made to modify Agee by specifically providing analog

streams, in order to transmit enhanced portion for the layered coding. The Agee MIMO

transmission, incorporating the Schreiber analog streams for the transmission of

enhanced portion for the layered coding, has all the features of claim 58.

Regarding **claim 59**, the Agee MIMO transmission, incorporating the Schreiber

analog streams for the transmission of enhanced portion for the layered coding, as

applied to claim 58, discloses wherein the streams include symbol streams that at least

partially have a representation of data along a continuous analog range (Schreiber:

Fig.7, the length of the line correspond to continuous analog range).

Regarding **claim 60**, the Agee MIMO transmission, incorporating the Schreiber

analog streams for the transmission of enhanced portion for the layered coding, as

applied to claim 58, discloses wherein the streams include symbol streams that at least

partially are selected from a constellation in which closer bins have closer values

(Schreiber: Fig.7, distance within each group of 4 constellations is smaller compared to

distance between other groups of 4).

Regarding **claim 61**, the Agee MIMO transmission, incorporating the Schreiber

analog streams for the transmission of enhanced portion for the layered coding, as

applied to claim 58, discloses wherein the streams include symbol streams that

represent an overlap of coarse and refinement portions (Schreiber:Fig.7, Hybrid

constellation, refinement portion is carried over analog).

16.   **Claims 62-63** are rejected under 35 U.S.C. 103(a) as being unpatentable over Li

(US 2001/0,053,143) in view of Jongen (US 2001/0,033,622), hereafter referenced as Li

and Jongren respectively.

Regarding **claim 62**, Li discloses MIMO OFDM System. Li specifically discloses

A method of receiving data (Fig.4), comprising:

receiving (each receive antenna receives a signal, paragraph 11) transmitted MIMO

signals (MIMO channel, paragraph 5) using a plurality of antennas (multiple transmit

and receive antennas, paragraph 5) including at least one antenna more in reception

than used in transmitting the signals (4 transmit antenna and 10 receive antenna,

paragraph 77). However, Li fails to disclose determining from the signal of at least one

of the receiver antennas a noise level of a link on which the signals are received; and

instructing the transmitter to change a transmission parameter responsive to a

determination that the noise level is above an allowed level.

In the analogous field of endeavor, Jongren discloses Robust Utilization of

Feedback Information in Space-Time Coding. Jongren specifically discloses

determining from the signal of at least one of the receiver antennas a noise level of a

link on which the signals are received (received signal-to-noise ratio, paragraph 5); and

instructing the transmitter to change a transmission parameter (Adjust amplitude and/or phase of signal, paragraph 5), in order to maximize signal-to-noise ratio (paragraph 5).

Therefore, given this teaching, it would have been obvious to one of ordinary skill in the art at the time invention was made to modify Li by specifically providing adjusting amplitude and phase of transmission signal, in order to maximize received signal to noise ratio. However, Li and Jongren still fail to disclose changing transmitter parameter responsive to a determination that the noise level is above an allowed level.

However, it was obvious variation of Jongren changing transmitter parameter responsive to a determination that signal-to-noise ratio (noise level) is above an allowed level, in order to establish communication fast rather than trying the best mode.

Therefore, given this teaching, it would have been obvious to one of ordinary skill in the art at the time invention was made to modify Li and Jongren by specifically providing changing transmitter parameter responsive to a determination that signal-to-noise ratio (noise level) is above an allowed level, in order to establish communication fast rather than trying the best mode. The Li MIMO OFDM system, incorporating the Jongren adjusting amplitude and phase of transmission signal responsive to a determination that signal-to-noise ratio (noise level) is above an allowed level, discloses all the features of claim 62.

Regarding **claim 63**, Li and Jongren discloses everything claimed as above (see claim 62). Li further discloses decoding the signals using the received signals (decodes space-time codes, paragraph 10)

Conclusion

17.   The prior art made of record and not relied upon is considered pertinent to

applicant's disclosure. Vahid (US 7,555,658) discloses Embedded Electronics Building

Blocks for User-Configurable Monitor/Control Networks.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to HEE-YONG KIM whose telephone number is (571)270-

3669. The examiner can normally be reached on Monday-Thursday, 8:00am-5pm EST.

       If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Marsha Banks-Harold can be reached on 571-272-7905. The fax phone

number for the organization where this application or proceeding is assigned is 571-

273-8300.

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/HEE-YONG KIM/
Examiner, Art Unit 2621

/Andy S. Rao/

Primary Examiner, Art Unit 2621
September 27, 2010